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PATENT APPLICATION

ATTORNEY DOCKET NO. 200309715-1

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): B. Mark Hirst

Confirmation No.:

Application No.: 10/780,927

Examiner: Patel, Rajnikant B.

Filing Date: 02/17/2004

Group Art Unit: 2828

Title: SNUBBER CIRCUIT

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on October 5, 2006.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) $500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d)) for the total number of months checked below:

☐ 1st Month $120	☐ 2nd Month $450	☐ 3rd Month $1020	☐ 4th Month $1590

☐ The extension fee has already been filed in this application.

☒ (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account 08-2025 the sum of $ 500. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

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Rev 10/05 (ApiBrief)

Atty. Dkt. No. 200309715-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellants:	B. Mark Hirst
Title:	SNUBBER CIRCUIT
Appl. No.:	10/780,927
Filing Date:	02/17/2004
Examiner:	Patel, Rajnikant B.
Art Unit:	2828

BRIEF ON APPEAL

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

1. Real Party In Interest

The real party in interest is Hewlett-Packard Development Company, LP, a limited partnership established under the laws of the State of Texas and having a principal place of business at 20555 S.H. 249, Houston, TX 77070, U.S.A. (hereinafter "HPDC"). HPDC is a Texas limited partnership and is a wholly-owned affiliate of Hewlett-Packard Company, a Delaware corporation, headquartered in Palo Alto, California. The general or managing partner of HPDC is HPQ Holdings, LLC.

2. Related Appeals and Interferences

There are no related appeals or interferences that will directly affect, be directly affected by, or have a bearing on the present appeal, that are known to Appellants or Appellants' patent representative.

3. Status of Claims

Claims 1-45 were originally pending in the application. In a first substantive Office Action mailed on February 28, 2006, Claims 21-30 were withdrawn from consideration based on an earlier restriction requirement dated December 15, 2005 and a subsequent election by Appellants on January 6, 2006. In response to the first substantive Office Action mailed on February 28, 2006, Appellants amended Claims 31, 35 and 39. This is an appeal from the Final Office Action mailed on July 5, 2006 finally rejecting Claims 1-20 and 31-45. The present appeal is directed to Claims 1-20 and 31-45, i.e., all of the presently pending claims that stand rejected in this application.

4. Status of Amendments

No amendments were filed after the Final Office Action.

5. Summary of Claimed Subject Matter

Claim 1 is directed to an apparatus which includes a switching circuit ((840, Fig 8); (940, 918, 942, 928, Fig. 9); (1040, 1018, 1042, 1028, Fig. 10); (1140, 1142, Fig. 11));, a control circuit (820, Fig. 8) coupled to the switching circuit and a biasing snubber circuit ((810, Fig. 8), (920, 922, 972, 924, 916, 914, 970, 912 and 910, Fig. 9); (1020, 1022, 1024, 1072, 1016, 1070, 1012, 1014 and 1010, Fig. 10); (1120, 1123, 1180, 1124, 1172, 1180, 1116, 1180, 1114, 1113 and 1110, Fig. 11); (C1, C2, C3, diodes and resistors,1216, 1282, 1284 and 1280, Fig. 12); (1320, 1386, 1316, 1384, 1320, and 1386, Fig. 13); (1440, Fig. 14) coupled to the switching circuit and the control circuit to capture energy from a circuit-switched by the switching circuit and to provide at least a portion of the captured energy to bias the control circuit. (See Para. [0045]; pg. 12, lines 24-26).

Claim 31 is directed to a snubber circuit which includes a first energy storage device (910, 920, 1010, 1020, 1120, 1110, (C1 or C2, Fig. 12), 1320, 1410) circuitry ((922, 972, 924, 914, 970, 912, Fig. 9); (1022, 1024, 1072, 1070, 1012, 1014, Fig. 10); (1123, 1180, 1124, 1172, 1180, 1180, 1114, 1113, Fig. 11); (C1, C2, C3,

unnumbered diodes and resistors, 1216, 1282, 1284 and 1280, Fig. 12); (1386, 1384, Fig. 13); (1440, Fig. 14) coupled to the first energy storage device to facilitate capturing, by the first energy storage device, energy of a switching circuit and to facilitate resetting of the first energy storage device and a second energy storage device (916, 1016, 1116, 1216, 1316 and 1416) coupled to the first energy storage device to store the captured energy and to provide at least a portion of the captured energy to a control circuit (820, Fig. 8) (See Para. [0045]; pg. 12, lines 24-26).

Claim 39 is directed to a method of supplying power to a control circuit (820, Fig. 8). The method includes capturing and energy of a switching circuit in a first energy storage device (910, 920, 1010, 1020, 1120, 1110, (C1 or C2, Fig. 12), 1320, 1410) and providing at least a portion of the captured energy in the first energy storage device to a second energy storage device (916, 1016, 1116, 1216, 1316 and 1416) and providing at least a portion of energy stored on the second energy storage device to power the control circuit (820, Fig. 8) (See Para. [0045]; pg. 12, lines 24-26)..

Claim 43 is directed to a snubber circuit to power a first circuit (820, Fig. 8). This snubber circuit includes means for capturing energy of a switching circuit ((940, 918, 942, 928, Fig. 9); (1040, 1018, 1042, 1028, Fig. 10); (1140, 1142, Fig. 11));, in a first energy storage device (910, 920, 1010, 1020, 1120, 1110, (C1 or C2, Fig. 12), 1320, 1410), means ((922, 972, 924, 914, 970, 912, Fig. 9); (1022, 1024, 1072, 1070, 1012, 1014, Fig. 10); (1123, 1180, 1124, 1172, 1180, 1180, 1114, 1113, Fig. 11); (C1, C2, C3, unnumbered diodes and resistors, 1216, 1282, 1284 and 1280, Fig. 12); (1386, 1384, Fig. 13); (1440, Fig. 14) for providing at least a portion of the captured energy in the first energy storage device to a second energy storage device (916, 1016, 1116, 1216, 1316 and 1416) and means (905, 1105, 1305 and 1405) for providing at least a portion of the energy stored on the second energy storage device to power the first circuit (820, Fig. 8) (See Para. [0045]; pg. 12, lines 24-26).

6. Grounds of Rejection to be Reviewed on Appeal

The issues on appeal are whether the Examiner erred in rejecting Claims 1-2, 6-7, 31-35 and 39-43 under 35 U.S.C. § 102(b) as being as being anticipated by U.S. Patent No. 6,438,004 (Tanaka) and whether the Examiner erred in rejecting Claims 3-5, 17-20, 35-38 and 44-45 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,438,004 (Tanaka).

7. Argument

I. Legal Standards

A. Law of Anticipation

Claims 1-2, 6-7, 31-35 and 39-43 have been rejected under 35 U.S.C. § 102(b), which states:

> A person shall be entitled to a patent unless –
>
> ...
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States,
>
> ....

Under Section 102, a claim is anticipated, i.e., rendered not novel, when a prior art reference discloses every limitation of the claim. In re Schreiber, 128 F.3rd 1473, 1477 (Fed. Cir.1997). Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." In re Mills, 916 F.2d 680, 682 (Fed. Cir. 1990). "Rejections under 35 U.S.C. § 102(a) are proper only when the claimed subject matter is identically disclosed or described in the prior art." In re Arkley, Eardley, and Long, 172 U.S.P.Q. 524, 526 (CCPA 1972).

Claim terms will be given their ordinary and accustomed meaning, unless there is "an express intent to impart a novel meaning to [the] claim [term]" by the

patentee. York Prods., Inc. v. Cent. Tractor Farm & Family Ctr., 99 F.3d 1568, 1572 (Fed. Cir. 1996); Sage Prods. v. Devon Indus., Inc., 126 F.3d 1420, 1423 (Fed. Cir. 1997). The ordinary and accustomed meaning of a claim term is determined by reference to dictionaries, encyclopedias, and treatises available at the time of the patent. See Texas Digital Systems, Inc., 308 F.3d at 1203. Such references are always available for claim construction purposes and are neither extrinsic nor intrinsic evidence. See Texas Digital Systems, Inc. v. Telegenix, Inc., 308 F.3d 1193, 1202-03 (Fed. Cir. 2002).

In order to impart a specific meaning to a claim term, i.e., for the inventor to be her own lexicographer, such lexicography must appear "with reasonable clarity, deliberateness, and precision." In re Paulsen, 30 F.3d 1475, 1480 (Fed. Cir. 1994). However, intrinsic evidence may be consulted to determine the definite meaning of a claim term that is unclear. CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 1367 (Fed. Cir. 2002). A claim term may be redefined without any express statement of redefinition in the specification. Bell Atl. Network Servs., Inc. v. Covad Communications Group, Inc., 262 F.3d 1258, 1268 (Fed. Cir. 2001). "[A] claim term will not carry its ordinary meaning if the intrinsic evidence shows that the patentee distinguished that term from prior art on the basis of a particular embodiment" or "described a particular embodiment as important to the invention."

B. Law of Obviousness

Claims 3-5, 17-20, 35-38 and 44-45 is rejected under 35 U.S.C. § 103(a), which states:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The legal standards under 35 U.S.C. § 103(a) are well-settled. Obviousness under 35 U.S.C. § 103(a) involves four factual inquires: 1) the scope and content of the prior art; 2) the differences between the claims and the prior art; 3) the level of ordinary skill in the pertinent art; and 4) secondary considerations, if any, of nonobviousness. See Graham v. John Deere Co., 383 U.S. 1, 148 U.S.P.Q. 459 (1966).

In proceedings before the Patent and Trademark Office, the Examiner bears the burden of establishing a prima facie case of obviousness based upon the prior art. In re Piasecki, 745 F.2d 1468, 1471-72, 223 U.S.P.Q. 785, 787-88 (Fed. Cir. 1984). "[The Examiner] can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." In re Fritch, 972 F.2d 1260, 1265, 23 U.S.P.Q. 2d 1780, 1783 (Fed. Cir. 1992).

As noted by the Federal Circuit, the "factual inquiry whether to combine references must be thorough and searching." McGinley v. Franklin Sports, Inc., 262 F.3d 1339, 60 U.S.P.Q. 2d 1001 (Fed. Cir. 2001). Further, it "must be based on objective evidence of record." In re Lee, 277 F.3d 1338, 61 U.S.P.Q. 2d 1430 (Fed. Cir. 2002). The teaching or suggestion to make the claimed combination must be found in the prior art, and not in the applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 U.S.P.Q. 2d 1438 (Fed. Cir. 1991). The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In re Mills, 916 F.2d 680, 16 U.S.P.Q. 2d 1430 (Fed. Cir. 1990). "It is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to '[use] that which the inventor taught against its teacher.'" Lee (citing W.L. Gore v. Garlock, Inc., 721 F.2d 1540, 1553, 220 U.S.P.Q. 303, 312-13 (Fed. Cir. 1983)). Teaching away from the claimed invention is a strong indication of non-obviousness and an improper combination of references. U.S. v. Adams, 383 U.S. 39 (1966).

II. The Examiner's Rejection of Claims 1-2, 6-7, 31-35 and 39-43 under 35 U.S.C. § 102(b) as being as being anticipated by U.S. Patent No. 6,438,004 (Tanaka) Should Be Reversed Because Tanaka Does Not Disclose Every Limitation of Each of the Claims.

The claimed invention is not anticipated under § 102 unless each and every element of the claimed invention is found in the prior art. (Hydratech, Inc. v. Monochronal Antibodies, Inc., Fed. Cir. 1986). Accordingly, the rejection of these claims under 35 U.S.C. § 102(b) is improper and should be reversed.

A. Claim 1

Independent Claim 1 is directed to an apparatus which includes a biasing snubber circuit. The biasing snubber circuit is coupled to a switching circuit and a control circuit to capture energy from a circuit switched by the switching circuit. The snubber circuit provides at least a portion of the captured energy to bias the control circuit.

Tanaka fails to disclose an apparatus having a snubber circuit that captures energy from a circuit switched by switching circuit and provide at least a portion of the captured energy to bias a control circuit. In contrast, Tanaka merely discloses a circuit wherein energy captured by a snubber circuit is retransmitted back to Vin. The captured energy is not used to bias a control circuit.

In fact, in column 15, line 45 through column 16, line 38, Tanaka specifically discloses:

> In FIG. 14, Vg indicates a driving signal for the switches. First, given that the main switch Q1 is in ON-state. When the main switch Q1 is turned off, the main switch starts the commutation of the load current. However, when the load current is less than the threshold I.sub.th, it takes time to commutate due to the snubber capacitor connected in parallel with the main switch, and thereby the main switch can be turned on with leaving voltage in the snubber capacitor. This causes a short-circuit loss because the accumulated energy in the capacitor is consumed by the main switch. In order to prevent this, the fourth and sixth auxiliary switches Q4, Q6 are turn on in conjunction with the turn-

on of the main switch Q1 at the time T.sub.0 in the waveform shown in FIG. 14. ***Then, resonance is caused by the resonant inductor L1 and the snubber capacitors C1, C2. By this resonance, the voltage across the main switch Q2 is reduced, and goes down to zero at the time T.sub.1. Simultaneously, the resonant current Ir is refluxed along the path through the auxiliary switch Q4, the auxiliary switch Q6 and the diode D2.*** The "zero-voltage turn-on" can be achieved by turning on the main switch Q2 on and after the time T.sub.1. Further, when the auxiliary switch Q4 is turned off on and after the time T.sub.1, ***diodes D3, D5 are brought into conduction by the current Ir of the resonant inductor L1. Thus, the excited energy in the resonant inductor L1 is regeneratively returned to the input V.sub.In, and the regeneration is completed at the time T.sub.2. The above control prevents any short-circuit loss in light load current otherwise caused by the snubber capacitor.*** This control process is performed by voltage detection without detecting current. Thus, the detecting circuit can be simplified.

Referring to FIG. 15, Vg indicates a driving signal of the switches. At first, given that the main switch Q2 is in ON-state. When the main switch Q2 is turned off, the main switch starts to commutate by the load current. However, when the load current is less than the threshold I.sub.th, it takes time to the commutation due to the snubber capacitor connected in parallel with the main switch, and thereby the main switch can be turned on with leaving voltage in the snubber capacitor. This causes a short-circuit loss because the accumulated energy in the capacitor is consumed by the main switch. In order to prevent this, the third and fifth auxiliary switches Q3, Q5 are turned in conjunction with the turn-off of the main switch Q2 at the time T.sub.0 in the waveform shown in FIG. 15. ***Then, resonance is caused by the resonant inductor L1 and the snubber capacitors C1, C2. By this resonance, the voltage across the main switch Q1 is reduced, and goes down to zero at the time T.sub.1. Simultaneously, the resonant current Ir is refluxed along the path through the auxiliary switches Q3, Q5 and the diode D1.*** By turning on the main switch Q1 on and after the time T.sub.1, the zero-voltage turn-on can be achieved. When the auxiliary switch Q3 is turned off on and after the time T.sub.1, ***the diodes D4, D6 are brought into conduction by the current Ir of the resonant inductor L1. Then, the excited energy in the resonant inductor L1 is regeneratively returned to the input V.sub.in, and the regeneration is completed at the time T.sub.2. The above control can prevent any short-circuit loss in light load current otherwise caused by the snubber capacitor.*** This control process can provide the same effect as that of the control in FIG. 14.

(emphasis added). Thus, as can be determined from the above cited section of Tanaka, "energy in the resonant inductor L1" is "returned to the input" V_{in}. In contrast, the limitations of claim 1 recite "to provide at least a portion of the captured energy to bias the control circuit".

In response to such previous points, the Examiner maintains that Tanaka provides at least a portion of the captured energy to bias its control circuit by referring to column 3, lines 55+ (Final Office Action, pg. 2). However, nowhere in this citation to Tanaka does Tanaka disclose that energy captured by its snubber circuit is used to bias its control circuit. In fact, although Figure 1 of Tanaka illustrates a control circuit S, nowhere does Figure 1 illustrate any biasing of control circuit S. In contrast, the only inputs to the control circuit S in Figure 1 of Tanaka are input signals from Q1-Q6 and input signals from Vout, Iout. The input signals from Vout, Iout do not bias control circuit S, but are merely used by the control circuit S to calculate timing for the generation of switching signals. (See Tanaka, column 10, lines 1-10). Thus, the Examiner's assertion that Tanaka discloses providing at least a portion of captured energy by snubber circuit to bias the control circuit is without basis. Accordingly, the rejection of claim 1 is improper and should be reversed. The rejection of claims 2 and 6-7, which depend from claim 1, should also be reversed.

B. Claim 31

Independent claim 31 is directed to a snubber circuit which includes a first energy storage device, circuitry coupled to the first energy storage device to facilitate capturing, by the first energy storage device, of energy of a switching circuit and to facilitate resetting of the first energy device. The snubber circuit further includes a second energy storage device coupled to the first energy storage device to store the captured energy and to provide at least a portion of the captured energy to a control circuit.

Tanaka fails to disclose a snubber circuit having a first energy storage device which captures energy from a switching circuit and a second energy storage device coupled to the first energy storage device which stores the captured energy and

provides at least a portion of captured energy to a control circuit. As noted above with respect to Claim 1, Tanaka does not disclose providing energy captured by the snubber circuit to a control circuit. In contrast, the energy captured by the snubber circuit of Tanaka is retransmitted to Vin, not control circuit S.

Moreover, Tanaka does not disclose a first energy storage device that captures energy and a second energy device that stores the captured energy by the first energy storage device. In contrast, any energy captured by capacitors C1 and C2 of Tanaka is dissipated while energy captured by capacitor C3 is transmitted back to Vin, not to another energy storage device. Accordingly, the rejection of Claim 31 is improper and should be reversed. The rejection of Claims 32-35, which depend from Claim 31, should also be reversed.

C. Claim 39

Claim 39 is directed to a method of supplying power to a control circuit. The method includes (1) capturing energy of a switching circuit in a first energy storage device, (2) providing at least a portion of the captured energy in the first energy storage device to a second energy storage device and the (3) providing at least a portion of the energy stored on the second energy storage device to power the control circuit circuit.

Tanaka does not disclose a method wherein energy of a switching circuit is captured in a first energy storing device and is provided to a second energy storage device, wherein energy on the second energy storage device powers a control circuit. Tanaka does not disclose providing energy in a first energy storage device to a second energy storage device. Any energy stored on capacitors C1 and C2 of Tanaka would appear to be dissipated. Energy captured by capacitor C3 is not transmitted to another energy storage device but is transmitted to Vin.

Moreover, as noted above with respect to Claim 1, energy captured on capacitor C3 is not used to power control circuit S of Tanaka. Although Tanaka discloses control circuit S in Figure 1, nowhere does Tanaka illustrate or disclose control circuit S being powered by energy captured by a snubber circuit. Accordingly,

the rejection of Claim 39 is improper and should be reversed. The rejection of Claims 40-42, which depend from Claim 31, should also be reversed.

D. Claim 43

Claim 43 is directed to a snubber circuit to power a first circuit. The snubber circuit includes (1) means for capturing energy of a switching circuit in a first energy storage device, (2) means for providing at least a portion of the captured energy in the first energy storage device to a second energy storage device and the (3) means for providing at least a portion of the energy stored on the second energy storage device to power the first circuit.

As noted above with respect to Claim 39, Tanaka does not disclose providing energy in a first energy storage device to a second energy storage device. Any energy stored on capacitors C1 and C2 of Tanaka would appear to be dissipated. Energy captured by capacitor C3 is not transmitted to another energy storage device, but is transmitted to Vin.

In response to such points, the Examiner states that the "cited art also disclose the similar means for controlling power supply with snubber circuit, turning switch on with snubber capacitor (column 10, wine and a 10-25+." However, this basis for rejecting Claim 43 fails to even address the limitations of Claim 43. The Office Action fails to establish a prima facie rejection of Claim 43. Because Tanaka fails to disclose "means for providing at least a portion of the captured energy in the first energy storage device to a second energy storage device" and because the Examiner has failed to establish a prima facia case of anticipation, the rejection of Claim 43 should be reversed.

III. The Examiner's Rejection of Claims 3-5, 17-20, 35-38 and 44-45 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,438,004 (Tanaka) Should be Reversed Because It Would Not Be Obvious to Modify Tanaka so As to Include Every Limitation of Each of the Claims.

Claims 3-5 and 17-20, Claims 35-38 and Claims 44-45, depend from Claims 1, 31 and 43, respectively. Accordingly, the rejection of Claims 3-5, 17-20, 35-38 and 44-45 should be reversed for the same reasons discussed above with respect to Claims 1, 31 and 43..

Conclusion

In view of the foregoing, the Appellants submit that Claims 1-2, 6-7, 31-35 are not properly rejected under 35 U.S.C. § 102(b) as being as being anticipated by U.S. Patent No. 6,438,004 (Tanaka) and are therefore patentable. Claims 3-5, 17-20, 35-38 and 44-45 are not properly rejected under under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,438,004 (Tanaka) and are therefore patentable. Accordingly, Appellants respectfully request that the Board reverse all claim rejections and indicate that a Notice of Allowance respecting all pending claims should be issued.

Atty. Dkt. No. 200309715-1

Summary

For the foregoing, it is submitted that the Examiner's rejections are erroneous, and reversal of the rejections is respectfully requested.

Dated this 5th day of December, 2006.

Respectfully submitted,

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CLAIMS APPENDIX

1. (original) An apparatus comprising:

a switching circuit;

a control circuit coupled to the switching circuit; and

a biasing snubber circuit coupled to the switching circuit and the control circuit to capture energy from a circuit switched by the switching circuit and to provide at least a portion of the captured energy to bias the control circuit.

2. (original) The apparatus of claim 1 wherein the switching circuit comprises a DC switching circuit.

3. (original) The apparatus of claim 2 wherein the DC switching circuit comprises a buck converter circuit.

4. (original) The apparatus of claim 2 wherein the DC switching circuit comprises a boost converter circuit.

5. (original) The apparatus of claim 2 wherein the DC switching circuit comprises a flyback converter circuit.

6. (original) The apparatus of claim 1 wherein the switching circuit comprises an AC switching circuit.

7. (original) The apparatus of claim 6 wherein the biasing snubber circuit comprises first electrical circuitry to provide charge for storage on a charge storage device during a first phase of an AC flow and second electrical circuitry to provide charge for storage on the charge storage device during a second phase of the AC flow.

8. (original) The apparatus of claim 6 wherein the AC switching circuit comprises:

a first Field Effect Transistor (FET) having a first source, a first gate and a first drain;

a second FET having a second drain, a second source coupled to the first source and a second gate coupled to the first gate;

a first diode having a first anode coupled to the first source and a first cathode coupled to the first drain; and

a second diode having a second anode coupled to the second source and a second cathode coupled to the second drain.

9. (original) The apparatus of claim 6 wherein the AC switching circuit comprises:

a first Field Effect Transistor (FET) having a first source, a first gate and a first drain;

a second FET having a second drain, a second source coupled to the first source and a second gate coupled to the first gate;

a first diode having a first cathode coupled to the first source and a first anode coupled to the first drain; and

a second diode having a second cathode coupled to the second source and a second anode coupled to the second drain.

10. (original) The apparatus of claim 6 wherein the biasing snubber circuit comprises:

a first and second series resistor/capacitor pair correspondingly coupled to a first and a second drain of a first and a second Field Effect Transistor (FET) of the AC switching circuit;

a first diode coupled between a first source of the first FET and the first series resistor/capacitor pair, an anode of the first diode coupled to the first source and a cathode of the first diode coupled to the first series resistor/capacitor pair;

a second diode coupled between a second source of the second FET and the second resistor/capacitor pair, an anode of the second diode coupled

to the second source and a cathode of the second diode coupled to the second series resistor/capacitor pair;

a third diode, an anode of the third diode coupled to the cathode of the first diode;

a fourth diode, an anode of the fourth diode coupled to the cathode of the second diode and a cathode of the fourth diode coupled to a cathode of the third diode; and

a capacitor coupled between coupled cathodes of the third and fourth diodes and the first and second sources, the first and second sources coupled together.

11. (original) The apparatus of claim 6 wherein the biasing snubber circuit comprises:

a first terminal of a first capacitor and a first terminal of a second capacitor correspondingly coupled to a first and a second drain of a first and a second Field Effect Transistor (FET) of the AC switching circuit;

a first series linear-device/diode pair coupled between a second terminal of the first capacitor and a first source of the first FET;

a second series linear-element/diode pair coupled between a second terminal of the second capacitor and a second source of the second FET;

a first diode, wherein an anode of the first diode is coupled to the second terminal of the first capacitor;

a second diode, wherein an anode of the second diode is coupled to the second terminal of the second capacitor and a cathode of the second diode is coupled to a cathode of the first diode; and

a bias capacitor coupled between coupled cathodes of the first and second diodes and the first and second sources, the first and second sources coupled together.

12. (original) The apparatus of claim 11 wherein the first series linear-device/diode pair comprises a first resistor and a third diode and the second series linear-device/diode pair comprises a second resistor and a fourth diode.

13. (original) The apparatus of claim 11 wherein the first series linear-device/diode pair comprises a first inductor and a third diode and the second series linear-device/diode pair comprises a second inductor and a fourth diode.

14. (original) The apparatus of claim 13 wherein anodes of third and fourth diodes are coupled to the coupled sources and cathodes of the third and fourth diodes are correspondingly coupled to the first and the second inductors.

15. (original) The apparatus of claim 11 wherein the biasing snubber circuit further comprises:

a first terminal of a first resistor and a first terminal of a second resistor correspondingly coupled to the anode of the first diode and the anode of the second diode;

a full wave diode bridge rectifier having four bridge diodes, wherein a first terminal of the full wave bridge rectifier coupled to the bias capacitor, a second terminal of the full wave bridge rectifier coupled to a second terminal of the first resistor, a third terminal of the full wave bridge rectifier coupled to a second terminal of the second resistor and a fourth terminal of the full wave bridge rectifier coupled to a ground node, the ground node comprising the coupled first and second sources.

16. (original) The apparatus of claim 11 wherein the biasing snubber circuit further comprises:

a first resistor wherein a first terminal of the first resistor is coupled to the first terminal of the first capacitor and a second terminal of the first resistor is coupled to the second terminal of the first capacitor; and

a second resistor wherein a first terminal of the second resistor is coupled to the first terminal of the second capacitor and a second terminal of the second resistor is coupled to the second terminal of the second capacitor.

17. (original) The apparatus of claim 6 further comprising a load coupled to the AC switching circuit.

18. (original) The apparatus of claim 17 wherein the load comprises an inductive heating device.

19. (original) The apparatus of claim 17 wherein the load comprises a single phase induction motor.

20. (original) The apparatus of claim 17 wherein the load comprises a fuser.

21. (withdrawn) An imaging system comprising:

a processor;

a networking interface; and

an imaging subsystem coupled to the processor, the imaging subsystem including:

a switching circuit;

a control circuit coupled to the switching circuit; and

a biasing snubber circuit coupled to the switching circuit and the control circuit, wherein the biasing snubber circuit captures energy from a circuit switched by the switching circuit and wherein biasing snubber circuit provides at least a portion of the captured energy to bias the control circuit.

22. (withdrawn) The imaging system of claim 21 wherein the switching system comprises an AC switching system.

23. (withdrawn) The imaging system of claim 22 wherein the AC switching circuit comprises:

a first Field Effect Transistor (FET) having a first source, a first gate and a first drain;

a second FET having a second drain, a second source coupled to the first source and a second gate coupled to the first gate;

a first diode having a first anode coupled to the first source and a first cathode coupled to the first drain; and

a second diode having a second anode coupled to the second source and a second cathode coupled to the second drain.

24. (withdrawn) The imaging system of claim 22 wherein the biasing snubber circuit comprises first electrical circuitry to provide charge for storage on a charge storage device during a first phase of an AC flow and second electrical circuitry to provide charge for storage on the charge storage device during a second phase of the AC flow.

25. (withdrawn) The imaging system of claim 22 wherein the biasing snubber circuit comprises:

a first terminal of a first capacitor and a first terminal of a second capacitor correspondingly coupled to a first and a second drain of a first and a second Field Effect Transistor (FET) of the AC switching circuit;

a first series linear-device/diode pair coupled between a second terminal of the first capacitor and a first source of the first FET;

a second series linear-device/diode pair coupled between a second terminal of the second capacitor and a second source of the second FET;

a first diode, wherein an anode of the first diode is coupled to the second terminal of the first capacitor;

a second diode, wherein an anode of the second diode is coupled to the second terminal of the second capacitor and a cathode of the second diode is coupled to a cathode of the first diode; and

a bias capacitor coupled between coupled cathodes of the first and second diodes and the first and second sources, the first and second sources coupled together.

26. (withdrawn) The imaging system of claim 25 wherein the first series linear-device/diode pair comprises a first inductor and a third diode and the second series linear-device/diode pair comprises a second inductor and a fourth diode.

27. (withdrawn) The imaging system of claim 22 further comprising a load coupled to the AC switching circuit.

28. (withdrawn) The imaging system of claim 27 wherein the load comprises an inductive heating device.

29. (withdrawn) The imaging system of claim 27 wherein the load comprises a single phase induction motor.

30. (withdrawn) The imaging system of claim 27 wherein the load comprises a fuser.

31. (previously presented) A snubber circuit comprising:

a first energy storage device;

circuitry coupled to the first energy storage device to facilitate capturing, by the first energy storage device, energy of a switching circuit and to facilitate resetting of the first energy storage device; and

a second energy storage device coupled to the first energy storage device to store the captured energy and to provide at least a portion of the captured energy to a control circuit.

32. (original) The snubber circuit of claim 31 wherein the switching circuit is a DC switching circuit.

33. (original) The snubber circuit of claim 31 wherein the switching circuit is an AC switching circuit.

34. (original) The snubber circuit of claim 31 wherein the circuitry comprises a plurality of diodes.

35. (Previously presented) The snubber circuit of claim 31 wherein the second energy storage device provides a bias source for the control circuit of the switching circuit..

36. (original) The snubber circuit of claim 31 wherein the second energy storage device provides a bias source for a fan.

37. (original) The snubber circuit of claim 31 wherein at least one of the first and second energy storage devices comprises a capacitor.

38. (original) The snubber circuit of claim 31 wherein at least one of the first and second energy storage devices comprises an inductor.

39. (Previously presented) A method of supplying power to a control circuit comprising:

capturing energy of a switching circuit in a first energy storage device;

providing at least a portion of the captured energy in the first energy storage device to a second energy storage device; and

providing at least a portion of energy stored on the second energy storage device to power the control circuit.

40. (original) The method of claim 39 wherein the first circuit comprises a control circuit for the switching circuit.

41. (original) The method of claim 39 wherein the switching circuit comprises an AC switching circuit.

42. (original) The method of claim 39 wherein the switching circuit comprises a DC switching circuit.

43. (original) A snubber circuit to power a first circuit comprising:

means for capturing energy of a switching circuit in a first energy storage device;

means for providing at least a portion of the captured energy in the first energy storage device to a second energy storage device; and

means for providing at least a portion of energy stored on the second energy storage device to power the first circuit.

44. (original) The snubber circuit of claim 43 wherein at least one of the first energy storage device and the second energy storage device comprise capacitors.

45. (original) The snubber circuit of claim 43 wherein the first circuit comprises a control circuit for controlling the switching circuit.

EVIDENCE APPENDIX

There is no evidence previously submitted under 37 C.F.R. §§ 1.130, 1.131 or 1.132 or other evidence entered by the Examiner and relied upon by Appellant in this appeal. Accordingly, the requirements of 37 C.F.R. §§ 41.37(c)(1)(ix) are satisfied.

RELATED PROCEEDINGS APPENDIX

There are no decisions rendered by a Court of the Board in a proceeding identified in the Related Appeals and Interferences section. Accordingly, the requirements of 37 C.F.R. §§ 41.37(c)(1)(x) are satisfied.